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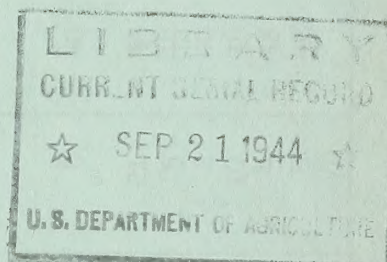
SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for the

COLORADO RIVER DRAINAGE BASIN

May 1, 1943

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Issued by the
United States Department of Agriculture
Soil Conservation Service
Division of Irrigation
In Cooperation with
The Colorado Agricultural Experiment Station
Colorado State College
Fort Collins, Colorado

May 10, 1943



SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for
COLORADO RIVER BASIN
May 1, 1943

The following data pertaining to snow surveys and irrigation water-supply forecasts are provided by the Division of Irrigation, Soil Conservation Service, U. S. Department of Agriculture, in cooperation with State departments, other federal bureaus and local organizations. The snow measurements are made principally by field personnel of the following Federal Government organizations: Forest Service, National Park Service, Geological Survey, Bureau of Reclamation, Indian Service; and the Utah Agricultural Experiment Station. This work is otherwise conducted cooperatively with the State Engineers of Utah, Colorado, and Wyoming, U. S. Geological Survey, Utah and Colorado Agricultural Experiment Stations, and various municipalities, irrigation associations, power companies, and others. Precipitation records are supplied by the U. S. Weather Bureau.

SUMMARY OF MAY 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth		Water Content		Number Courses in Average	Snow Density			1943 Water Content in percent of	
	Eight Year Avg.*	1942	1943	Eight Year Avg.*		1942	1943	Eight Year Avg.*	1942	
COLORADO RIVER	In.	In.	In.	In.		Percent	Percent	Percent		
Green River	16.9	7.6	6.7	9.8	6	40	40	48	146	327
Colorado River**	32.7	45.3	11.6	7.4	21	35	30	39	64	55
Yampa River	33.9	37.8	14.9	6.2	5	44	39	47	42	42
White River	27.4	45.6	11.0	0.5	2	40	35	28	5	3
Gunnison River	35.6	52.5	12.8	6.1	10	36	35	42	48	33
Dolores River	13.3	19.9	5.0	1.8	4	38	35	46	36	26
San Juan River	27.8	36.9	12.4	7.3	5	45	40	50	59	50

*Some for shorter periods

**Above Grand Junction, Colorado

PRECIPITATION DATA

(Based on incomplete returns)

WATERSHED	STATE	Precipitation October 1 to April 30	Departure from Normal	Precipitation	Departure from Normal
		Inches	Inches	April Inches	Inches
Colorado	Colorado	11.50	+0.41	0.70	-0.87
Green	Wyoming	8.95	+3.21	1.02	-0.02
San Juan	New Mexico	4.55	-1.31	0.26	-0.51
Gila	Arizona	4.01	-0.70	0.0	-0.31
Gila	New Mexico	4.26	-1.36	0.11	-0.37

Precipitation on the watershed of the Colorado River and its tributaries in Colorado, Wyoming, New Mexico and Arizona was below normal during April. The greatest deficiency for the month occurred on the watershed of the Colorado in Colorado. The accumulated precipitation since October 1 is above normal over the watershed of the Colorado and Green and considerably below normal over the watershed of the Gila and San Juan.

WATER SUPPLY OUTLOOK

Colorado River and Tributaries in Colorado. For the section of the main drainage above Grand Junction the snow cover was greatly depleted during April and the recent surveys on 21 courses show the average water content of the snow to be only 64 percent of the past eight year average and 55 percent of that of a year ago. At the higher elevations the snow pack is comparatively good at this time which is indicative of a fairly uniform river flow during the coming summer. The peak of the runoff will occur somewhat earlier this season and since the snow melt is now well under way the spring run-off is expected to cover a longer period at only a moderate high water stage. High stage of run-off may occur in some of the tributaries, such as the Blue, Roaring Fork and the North Fork of the Colorado River at Grand Lake and moderate to fairly high water of relatively short duration in the Eagle, South Fork of the Colorado and Williams Fork. The run-off in the Fraser, Troublesome, and Plateau Creek will be below normal. Because of deficient precipitation in April runoff in the Colorado drainage area will be somewhat less than that forecast last month.

For the Gunnison drainage the outlook is less promising than it was a month ago. The May first surveys show the average water content of the snow to be about one-half of the past 8-year mean and only one-third of that of a year ago. The depletion of the snow cover during April resulted largely through melting and deficient precipitation. The river stage May first was much above normal and the peak flow will probably occur prior to May fifteenth. The total run-off is expected to approximate that of last year. Soil moisture in the Uncompahgre Valley is below normal and range and crop conditions are fair to good. Planting season is about 10 days early and

-3-
use of water for irrigation is now under way. The Taylor Park Reservoir accumulated additional storage during April and is now two-thirds full with assurance of capacity filling early in June.

On the Yampa watershed the present water content of the snow is about one-half of that of a year ago. Early melting reduced the snow cover, especially at the lower elevations. At Columbine Lodge, on Rabbit Ears Pass, the water content of the snow May first was 12 inches. The peak run-off in this stream will also be earlier than usual and will only reach a moderate stage. Soil moisture conditions continue fair to good over the irrigated area except in the western portions of Moffat and Rio Blanco counties where it is only fair. Range and crop conditions are good. More than forty small reservoirs in this valley and tributary districts now hold on the average 70 percent of their capacity with the prospect of all being at capacity at the beginning of the irrigation season.

The run-off in the White River this season will be much below normal. The recent surveys over the headwaters of this stream indicate practically no snow at the lower elevations and only high mountain heavy drifts now remain to augment the summer flow.

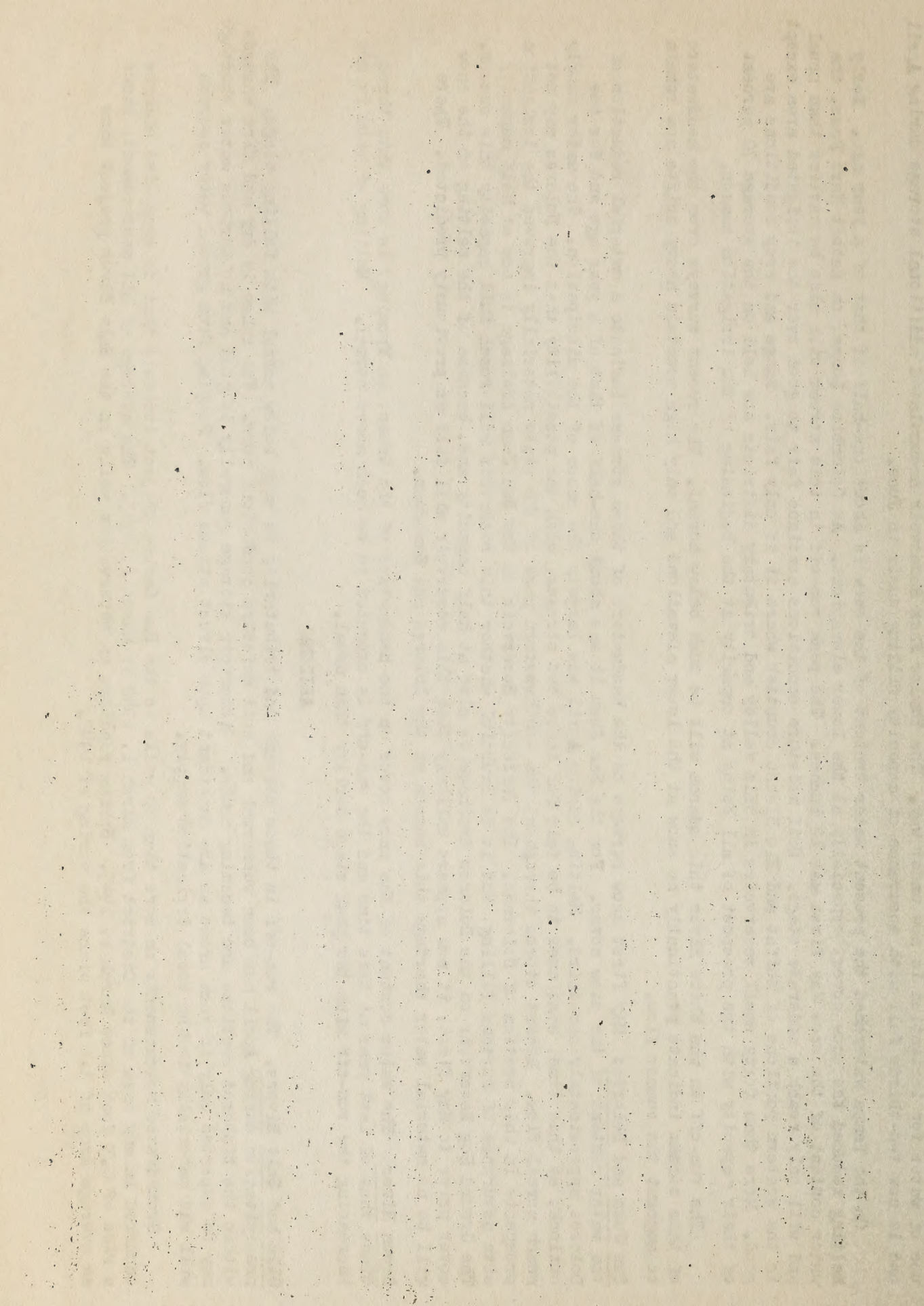
San Juan and Dolores: May first snow surveys on the headwaters of these streams indicate a material reduction of the water content of the snow cover. For the San Juan it was about one-half of that of a year ago and for the Dolores approximately one-third. Melting during April was largely the cause of the dissipation. The water supply outlook, at this time, continues to be fair for these two streams, with the possibility that the Dolores may not reach normal flow. Recent storms throughout the southwestern part of the state materially improved the irrigation prospects in this section of Colorado. The Vallecito Reservoir on the San Juan drainage is now at half capacity with assurance of further filling, but it is doubtful whether this reservoir will reach full capacity this season. The Ground Hog Reservoir on the Dolores drainage is also at half capacity and, because of the melting of the snow cover prior to May first, it now appears unlikely that this reservoir will fill as previously predicted. There will be no material water shortage this season on the Dolores and San Juan.

Green River. The water content of the snow cover on the headwaters of the Green, in Wyoming, is more than three times that of last year at this time and the run-off is expected to be much above normal. Melting of snow is now increasing the run-off with the peak stage earlier than usual.

ARIZONA

Gila and Salt Rivers. The run-off in these streams and tributaries is much below normal with falling stage. The precipitation during April has been subnormal and soil moisture conditions poor. The range is dry and fire hazards within the timbered sections are becoming acute. Reservoir storage generally is good and no serious water shortage may be expected only in such areas as are dependent upon direct stream flow. Pumping from ground water sources will add materially to the total irrigation supply.

Groundwater measurements on more than 80 wells in the San Carlos project indicate that no excessive changes occurred in any area of the District from March 1, 1942 to March 1, 1943. The average of all measurements shows a rise of 0.3 foot since March 1, 1943. Spring readings on observation wells in the Salt River project show an average drop of 3.3 feet since the spring of 1942.

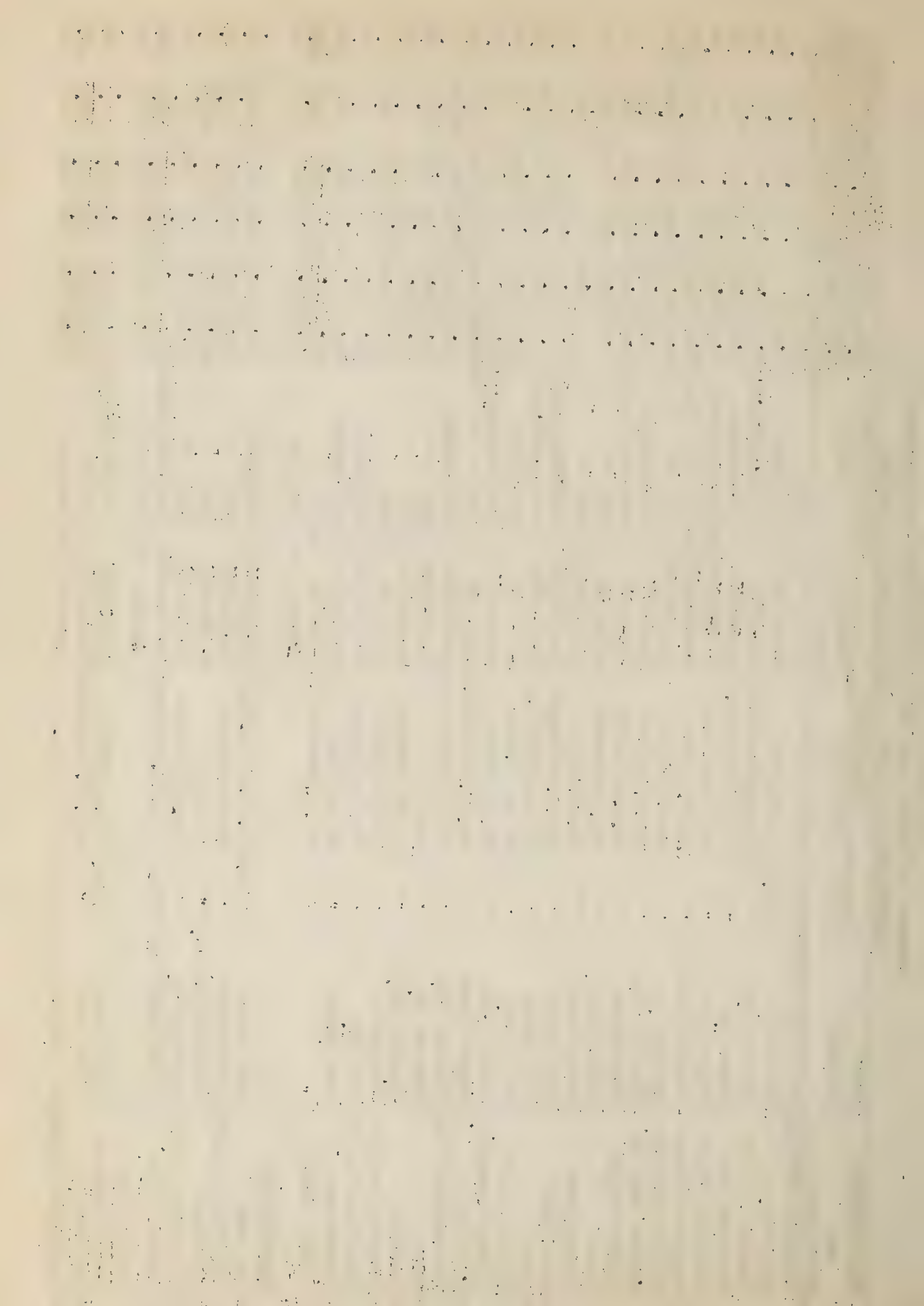


COLORADO RIVER WATERSHED

Summary of Federal and State Cooperative Snow Surveys
Issued May 10, 1943, at Fort Collins, Colorado

Main Drainage and Snow Course		Local Drainage	State	Location		Elev.	National Forest	May 1 Snow Cover Measurements				
No.	Snow Course			Locality	Description			Av. Snow Depth	Av. Water Content	1942	1943	1943
COLORADO RIVER (Above Grand Junction)												
7	Park View*	Willow Cr.	Colo.	7 mi. SE. Rand	24-5N-78W	9200	Routt	18.8	32.2	0.7	7.2	In. 9.8
12	Phantom Valley	Colorado R.	"	11 mi. N. Grand L.	7-5N-75W	9300	Ry. Mtn. N.P.	14.3	15.6	0.0	5.2	4.4
16	Berthoud Pass	Fraser R.	"	4 mi. S. West Port.	35-2S-75W	9700	Arapaho	41.0	59.0	22.3	14.5	16.3
19	Tennessee Pass*	Eagle River	"	Tennessee Pass	21-8S-80W	10200	Cochetopa	14.3	22.2	0.0	4.7	5.9
33	Ind. Pass Tunnel	Lincoln Gulch	"	W. Port. Tunnel	30-11S-82W	10200	Holy Cross	40.3	50.1	37.6	15.2	17.6
34	N. Lost Trail Cr.	Crystal R.	"	3 mi. E. Marble	20-11S-87W	9200	"	26.8	46.5	30.1	9.5	11.4
37	M. Fork Camp Gr.	Williams Fk.	"	13 mi. N. Dillon	16-3S-77W	9000	Arapaho	12.4	27.8	0.0	4.5	11.6
44	Fiddler Gulch	Eagle River	"	2 mi. E. Mitchell	1-8S-80W	11000	Holy Cross	40.1	59.3	22.1	13.2	17.7
45	Nast	Frying Pan R.	"	23 mi. SE. Basalt	1-9S-83W	8700	"	4.0	13.1	0.0	0.9	1.9
54	Maroon Lake	Maroon Creek	"	8 mi. SW. Aspen	7-11S-85W	9300	"	13.1	13.1	4.5	15.6	4.5
56	Mesa Lakes	Mesa Creek	"	15 mi. E. Palisade	35-11S-96W	10000	Grand Mesa	41.9	75.0	4.2	15.6	26.5
59	Lulu	Lulu Creek	"	14 mi. N. Grand L.	25-6N-76W	10200	Ry. Mtn. N.P.	55.1	60.8	39.8	19.7	12.8
62	Willow Creek P.	Willow Cr.	"	Willow Cr. Pass	1-4N-78W	9500	Arapaho	33.8	42.0	11.0	13.1	14.5
64	N. Inlet Grand L.	N. Inlet Cr.	"	4 mi. NE. Grand L.	26-4N-75W	9000	Ry. Mtn. N.P.	22.8	27.8	9.6	7.7	7.6
65	Lake Irene	Beaver Creek	"	1 mi. SW. Milner P.	8-5N-75W	10600	"	64.8	74.8	48.8	23.8	22.6
66	Thunderbolt Peak	Buchanan Cr.	"	5 mi. E. Monarch L.	22-2N-74W	9500	Arapaho	39.0	52.3	28.0	14.8	17.4
69	Arrow	S. Ranch Cr.	"	Arrow	34-1S-75W	9900	"	22.4	45.0	0.0	6.4	10.5
70	Lapland	St. Louis Cr.	"	7 mi. SW. Fraser	16-2S-76W	9300	"	19.2	33.2	7.7	6.3	9.2
79	Fremont Pass #2	Blue River	"	Fremont Pass	2-8S-79W	11400	"	49.6	63.4	46.9	17.0	19.2
91	Lynx Pass No. 2	Rock Cr.	"	7 mi. NE. Toponas	27-2N-83W	9100	Routt	20.8	27.6	2.3	7.8	8.2
96	Shrine Pass	Blue River	"	Shrine Pass	15-6S-79W	10500	Arapaho	49.8	56.0	43.6	16.8	17.2
97	Grizzly Peak	"	"	1 mi. W. Loveland P.	2-5S-76W	11250	"	56.0	66.9	45.1	19.0	20.8
				Average for Drainage				32.7	45.3	19.0	11.6	13.5
YAMPA RIVER												
6	Dry Lake	Soda Creek	Colo.	4 mi. NE. Steam. Spgs	26-7N-84W	8200	Routt	29.7	31.6	0.0	14.7	15.9
8	Columbine Lodge*	Harrison Cr.	"	Rbt. Ears Pass	21-5N-82W	9300	"	43.2	49.5	29.0	18.6	18.1
9	Elk River	Independence Cr.	"	Columbine	6-10N-85W	8700	"	28.6	32.6	7.3	11.3	11.6
91	Lynx Pass No. 2*	Morrison Cr.	"	7 mi. NE. Toponas	27-2N-83W	9100	"	20.8	27.6	2.3	7.8	8.2
10	Rambler R.S.	Little Snake R.	Wyo.	13 mi. SW. Encampmnt	25-14N-86W	8600	Medicine Bow	47.2	47.6	27.0	22.3	19.8
				Average for Drainage				33.9	37.8	13.1	14.9	14.7
WHITE RIVER												
35	Burro Mountain	N. Elk Creek	Colo.	8 mi. S. Buford	15-2S-91W	9000	White River	34.9	60.0	3.6	13.9	21.4
36	Rio Blanco	White River	"	4 mi. NW. Trappers L	28-1N-88W	8500	"	20.0	31.2	0.0	8.2	10.5
				Average for period of record.				27.4	45.6	1.8	11.0	16.0

*On adjacent drainage. @Average for period of record.



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			Locality					Av. Snow Depth		Av. Water Content			
								1942	1943	1942	1943		
No.						In.	In.	In.	In.	In.	In.	In.	
GUNNISON RIVER													
18	Crested Butte	Colo.	3mi. N. Crested B.	22-13S-86W	9000	Gunnison	11.8	15.9	9.6	4.5	5.6	3.0	
42	Marshall Creek	"	Marshall Pass	24-48N-6E	10800	Cochetopa	40.5	45.4	11.7	9.9	13.5	4.9	
43	Poncha Creek*	"	"	19-48N-7E	10500	"	21.0	40.5	1.5	7.5	12.9	0.8	
46	Park Cone	"	Taylor Park Res.	19-14S-82W	9700	Gunnison	11.2	19.2	4.4	3.6	6.7	1.9	
53	Alexander Lake	"	10mi. N. Cedaredge	2-12S-95W	10000	Grand Mesa	60.1	81.4	22.3	23.6	31.5	9.7	
55	Snowshoe Mesa	"	16mi. NE. Paonia	14-13S-89W	7500	Gunnison	0.0	0.0	0.0	0.0	0.0	0.0	
58	Ironton Park	"	5mi. S. Ouray	29-43N-7W	9800	Uncompahgre	21.2	50.8	0.0	8.3	18.2	0.0	
85	Trickle Divide	"	13mi. N. Cedaredge	23-11S-94W	10000	Grand Mesa	75.3	108.0	39.0	28.4	37.6	17.7	
87	Park Reservoir	"	11mi. " "	34-11S-94W	9500	"	64.2	87.4	29.3	25.0	32.9	12.6	
89	Porphyry Creek	"	Monarch Pass	19-49N-6E	10800	Cochetopa	50.8	76.0	26.9	17.6	23.8	10.2	
94	Sunshine Mt. No. 2	"	10mi. W. Lake City	35-44N-6W	10200	Gunnison	--	34.5	--	--	11.1	--	
			Average			for Drainage	35.6	52.5	14.5	12.8	18.3	6.1	
DOLORES RIVER													
23	Rico	Colo.	2mi. S. Rico	11-38N-11W	8700	Montezuma	2.3	0.0	0.0	0.9	0.0	0.0	
24	Telluride	"	Telluride	6-42N-8W	8600	"	2.0	4.0	0.0	0.6	0.2	0.2	
25	Lizard Head	"	10mi. N. Rico	24-41N-10W	10300	"	39.0	55.8	15.5	14.9	21.0	7.0	
90	Lone Cone	"	16mi. N. W. Rico	23-41N-13W	8900	"	10.0	19.9	0.0	3.4	6.8	0.0	
			Average			for Drainage	13.3	19.9	3.9	5.0	7.0	1.8	
SAN JUAN RIVER													
26	Wolf Creek Pass*	Colo.	Wolf Creek Pass	4-37N-2E	10000	Rio Grande	57.3	77.4	30.6	25.9	32.9	14.9	
29	Upper San Juan	"	4mi. W. Wolf Cr. P.	10-37N-1E	10000	San Juan	67.9	93.5	41.7	30.1	37.5	21.4	
30	Silverton Sub. S.	"	2mi. NE. Silverton	10-41N-7W	9400	"	3.1	6.0	0.0	1.3	1.0	0.0	
31	Cascade	"	5mi. N. Electra L.	12-39N-9W	8850	"	6.7	7.7	0.0	2.6	2.1	0.0	
93	Granite Peaks	"	11mi. NE. Columbus	24-73N-6W	7950	"	3.9	0.0	0.0	2.0	0.0	0.0	
18	Chamita*	N. Mex.	6mi. NW. Chama	36.9N106.7W	8500	Off Forest	--	--	--	--	--	--	
			Average			for Drainage	27.8	36.9	14.5	12.4	14.7	7.3	

*On adjacent drainage.

*On adjacent drainage.

@Average for period of record.

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			State	Locality			Description	Av. Snow Depth		Av. Water Content		In.	
								1942	1943	1942	1943		
							In.	In.	In.	In.	In.	In.	
GREEN RIVER													
23	Dutch Joe R.S.	Dutch Joe Cr.	Wyo.	12mi. N. Elkhorn	33-31N-104W	8700	Wyoming	8.0	1.8	2.1	2.7	0.6	0.8
24	Mulligan Park	Surveyor Cr.	"	Fremont Lake	17-35N-108W	8900	"	16.2	11.7	21.9	6.0	4.0	10.0
25	Kendall R.S.	Green River	"	27mi. NW. Pinedale	23-38N-110W	7900	"	10.5	2.9	19.9	4.6	1.4	9.5
26	Loomis Park	Beaver Cr.	"	25mi. NW. "	14-37N-111W	8500	"	23.8	12.8	30.0	9.8	5.3	14.6
27	Snyder Basin R.S.	S. Piney Cr.	"	22mi. W. Big Piney	15-29N-114W	8040	"	13.9	0.0	16.3	5.5	0.0	7.8
28	Piney-LaBarge	LaBarge Cr.	"	24mi. W. Big Piney	19-29N-114W	8820	"	29.0	16.7	32.3	11.6	6.6	15.8
Average for period of record							16.9	7.6	20.4	6.7	3.0	9.8	

@Average for period of record

RESERVOIR STORAGE

Reservoir Storage in Thousands of Acre-Feet, Colorado and Arizona, as of May 1 for the years 1934 to 1943, inclusive. (Based on data from the Bureau of Reclamation, Salt River Water Users' Association and other agencies.) A = Percentage of capacity. B = Percentage of 10-year average. C = Percentage of filling forecast for 1943.

Reservoir	Capacity	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	10-yr. Avg.	A	B	C
	Ac-Ft.	Ac-Ft.	Ac-Ft.	Ac-Ft.	Ac-Ft.	Ac-Ft.	Ac-Ft.	Ac-Ft.	Ac-Ft.	Ac-Ft.	Ac-Ft.	Ac-Ft.	%	%	%
UPPER COLORADO DRAINAGE															
Taylor Park	106.2	--	--	--	--	32.8	78.0	45.0	32.7	83.2	68.0	56.6	64	120	100
Vallecito	126.3	--	--	--	--	--	--	--	1.9	44.1	60.2	35.4	48	170	70
Ground Hog	21.7	--	--	--	--	--	--	2.1	1.5	21.2	14.5	9.8	67	148	80
Green Mtn.	146.9	--	--	--	--	--	--	--	--	--	52.0	--	--	--	--
SALT AND GILA DRAINAGES															
Roosevelt	1420.0	244.1	503.1	507.6	978.0	437.4	94.1	11.1	1398.4	1366.3	1182.2	672.2	83	176	--
Horse Mesa	245.1	188.0	219.2	237.8	240.3	236.2	213.5	68.4	239.6	224.9	236.4	210.4	96	112	--
Mormon Flat	58.0	40.3	51.3	40.4	33.3	47.2	42.2	50.8	57.2	46.4	43.8	45.3	76	97	--
Stewart Mt.	70.0	49.4	43.0	41.9	59.9	50.8	42.2	35.4	65.9	58.1	60.9	50.8	87	120	--
Bartlett	200.0	--	--	--	--	--	--	1.8	182.6	101.8	35.2	80.4	18	44	--
Carl Pleasant	173.0	0.6	55.2	12.8	102.7	25.9	8.6	5.3	184.5	70.8	4.8	47.1	3	10	--
San Carlos	1200.0	62.0	176.9	169.4	261.1	68.5	21.0	34.0	691.6	792.1	519.9	279.7	43	186	--

Some averages for shorter periods.

@ Some averages for shorter periods.

